AMENDMENTS TO THE CLAIMS

The following Listing of Claims will replace all prior versions and listings of claims in this application.

LISTING OF CLAIMS

1-12. (Cancelled)

13. (New) A method for displaying a vessel in real time during a medical intervention in a patient, comprising the steps:

a) recording and storing in a physical memory in a run-up to a medical intervention a sequence of 300 to 900 intravascular ultrasound images of the vessel from an intravascular ultrasound pull back sequence;

b) recording and storing in the same physical memory angiograms of the vessel obtained from an x-ray device while injecting contrast agent;

c) indexing the ultrasound images and angiograms at the time of their recording by respective locations of their recording in the vessel;

d) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic heartbeat;

e) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic breathing;

f) detecting a current location in the vessel of an object of interest in real time during a medical intervention using an x-ray or NMR device;

g) detecting a current value of the cyclic heartbeat using an eletrocardiogram;

h) detecting a current value of the cyclic breathing using a breathing sensor;

i) using selection criteria to select three or more ultrasound images from the sequence of stored ultrasound images, wherein the selection criteria correspond nearly to the current location and current values of the cyclic heartbeat and the cyclic breathing;

j) using weighted selection criteria so that the selected ultrasound images are a compromise between the current location, the current value of the cyclic heartbeat, and the current value of the cyclic breathing; and

k) displaying the selected ultrasound images concurrently with an x-ray image of the vessel, the display showing the geometric position of the ultrasound images with reference to the x-ray image by means of an arrow or cross, and connecting the ultrasound images in the display with connecting lines, wherein the display shows the vessel cross section at the location of the object of interest.

14. (New) The method of claim 13, wherein the object of interest is a catheter tip.

15. (New) The method of claim 13, wherein the object of interest is an anatomical vessel structure.

16. (New) The method of claim 13, wherein the medical intervention is a catheter examination of the heart.

17. (New) The method of claim 13, wherein the vessel is a heart vessel.

18. (New) A computer-readable storage medium storing instructions executable by a computer, the instructions operable to perform a method for displaying a vessel in real time during a medical intervention in a patient, the method comprising the steps:

a) recording and storing in physical memory in a run-up to a medical intervention a sequence of 300 to 900 intravascular ultrasound images of the vessel from an intravascular ultrasound pull back sequence;

b) recording and storing in the same physical memory angiograms of the vessel obtained from an x-ray device while injecting contrast agent;

c) indexing the ultrasound images and angiograms at the time of their recording by respective locations of their recording in the vessel;

d) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic heartbeat;

e) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic breathing;

f) detecting a current location in the vessel of an object of interest in real time during a medical intervention using an x-ray or NMR device;

g) detecting a current value of the cyclic heartbeat using an eletrocardiogram;

h) detecting a current value of the cyclic breathing using a breathing sensor;

i) using selection criteria to select three or more ultrasound images from the sequence of stored ultrasound images, wherein the selection criteria correspond nearly to the current location and current values of the cyclic heartbeat and the cyclic breathing;

j) using weighted selection criteria so that the selected ultrasound images are a compromise between the current location, the current value of the cyclic heartbeat, and the current value of the cyclic breathing; and

k) displaying the selected ultrasound images concurrently with an x-ray image of the vessel, the display showing the geometric position of the ultrasound images with reference to the x-ray image by means of an arrow or cross, and connecting the ultrasound images in the display with connecting lines, wherein the display shows the vessel cross section at the location of the object of interest.

19. (New) A computer programmed to perform a method for displaying a vessel in real time during a medical intervention in a patient, the method comprising the steps:

a) recording and storing in physical memory in a run-up to a medical intervention a sequence of 300 to 900 intravascular ultrasound images of the vessel from an intravascular ultrasound pull back sequence;

b) recording and storing in the same physical memory angiograms of the vessel obtained from an x-ray device while injecting contrast agent;

c) indexing the ultrasound images and angiograms at the time of their recording by respective locations of their recording in the vessel;

d) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic heartbeat;

e) indexing the ultrasound images and angiograms at the time of their recording by respective values of a cyclic breathing;

f) detecting a current location in the vessel of an object of interest in real time during a medical intervention using an x-ray or NMR device;

g) detecting a current value of the cyclic heartbeat using an eletrocardiogram;

h) detecting a current value of the cyclic breathing using a breathing sensor;

i) using selection criteria to select three or more ultrasound images from the sequence of stored ultrasound images, wherein the selection criteria correspond nearly to the current

location and current values of the cyclic heartbeat and the cyclic breathing;

j) using weighted selection criteria so that the selected ultrasound images are a compromise between the current location, the current value of the cyclic heartbeat, and the current value of the cyclic breathing; and

k) displaying the selected ultrasound images concurrently with an x-ray image of the vessel, the display showing the geometric position of the ultrasound images with reference to the x-ray image by means of an arrow or cross, and connecting the ultrasound images in the display with connecting lines, wherein the display shows the vessel cross section at the location of the object of interest.